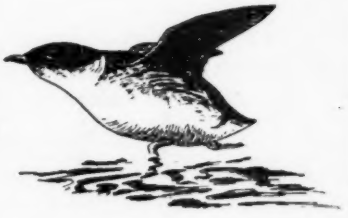
The MURRELET



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Contents

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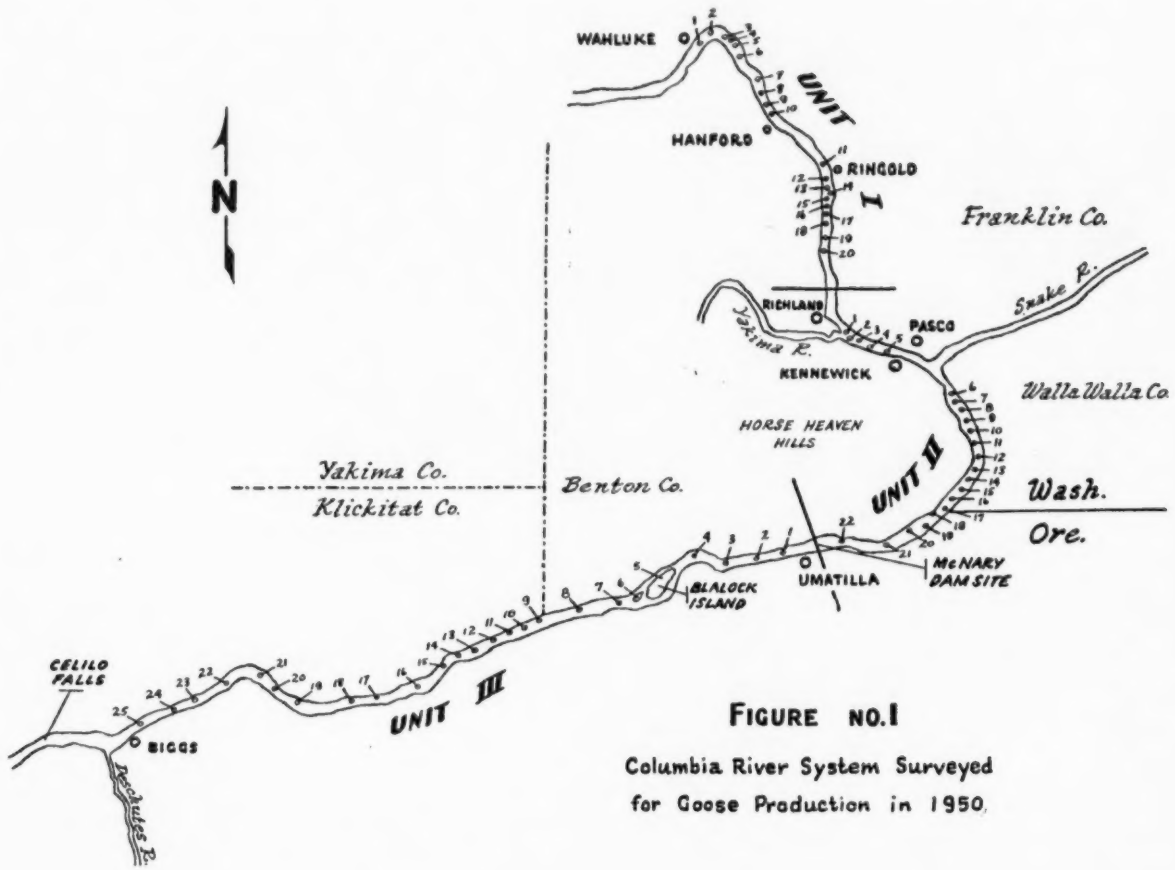

FIGURE NO.1

Columbia River System Surveyed for Goose Production in 1950.

THE STATUS OF RESIDENT CANADA GEESE IN SOUTH-CENTRAL WASHINGTON, SPRING, 1950

HENRY A. HANSEN AND WENDELL H. OLIVER

During a few weeks in the spring of 1950 a cursory investigation was made to determine the breeding status of the Canada goose (*Branta canadensis moffitti*) in eastern Washington and to evaluate more specifically the islands on the Columbia River of south-central Washington as goose nesting habitat. Although for the past few years goose nesting records have been kept for the upper Snake and Palouse rivers, the Turnbull National Wildlife Refuge, and some of the extensive "scabland" waterfowl habitat of eastern Washington, the lower Snake and Columbia rivers had not been objectively surveyed by state game department personnel previously. The numerous islands of the lower Snake and Columbia rivers have proved to be of primary importance to nesting Canada geese in Washington.

This paper will deal with a survey of the Columbia River between the abandoned Wahluke Ferry site in the Hanford AEC Reservation and the mouth of the Deschutes River above Celilo Falls, a linear distance of about 150 miles (see Figure 1). There is a large section of the lower Snake River between Lyons Ferry and the junction of the Snake with the Columbia that is probably of comparable importance in goose production as the Columbia River under discussion. During April, 1950, two game department biologists floated down the Snake River from Lyons Ferry to Pasco. Incidental to other work, they counted 261 geese and 46 goose nests on and near the 20 islands in this stretch of river. These were casual observations, however, and no attempt was made that spring to assess the production potential in the area.

On the section of the Columbia River shown in Figure 1 there are 67 islands varying in size from one-acre sandbars to the 3,400-acre Blalock Island below Umatilla Rapids. Many of the smaller islands become completely inundated with the flood crest in June, but there is permanent sagebrush, rabbit brush, giant rye grass, and many other species of perennial vegetation above flood level on the large islands. This entire area can be divided into three natural units, and will be designated hereinafter as Unit I, Unit II, and Unit III.

Unit I is that portion of the Columbia River from Wahluke Ferry downstream to the town of Richland. The river, all its islands, and both shore lines of Unit I are entirely within the boundary of the Hanford Reservation. All of this unit is an inviolate refuge, supposedly, not even subject to a possibility of poaching or to fishermen's activities. All the islands are assured of permanency in their present condition because the lake behind McNary Dam cannot rise upstream above Richland, and at no time in the foreseeable future will anything be done on the reservation to affect the normal seasonal fluctuation of the river. There are 20 islands in two groups of ten islands each in Unit I. The upper group of islands extends along ten miles of river from Wahluke downstream almost to the abandoned town of Hanford. The next group of ten islands extends about 14 miles between Ringold and Richland. For convenience in future reference the islands have been numbered consecutively starting with Number 1 at the upper end.

Unit II is that portion of the Columbia River, and a few miles of the lower Snake

and Yakima rivers, that will form the lake behind McNary Dam. There are 35 or 40 miles of river in Unit II with a total of 23 islands rather uniformly spaced at present. When McNary Dam is completed, probably by 1952, all of this island nesting habitat will be lost in the lake formed behind the dam. The islands in Unit II have been numbered starting with island Number 1 at the mouth of the Yakima River. Strawberry Island, a few miles up the mouth of the Snake River, has been included in this group although it will not be lost with the others in McNary Lake.

Unit III includes the Columbia River from McNary Dam to the beginning of Celilo Falls. There are 24 islands of importance in this unit dispersed uniformly along approximately 75 miles of river. It is not anticipated that any construction will be planned for the immediate future which will destroy or alter these islands in Unit III. The islands of this unit have been numbered in another sequence beginning with Number 1 below Umatilla Rapids. Figure 1 is a small-scale map of the river system surveyed showing the designated units and the relative position of the islands in each.

A small power boat was used to reach the various islands. The inventory consisted of a flush-count census while walking out the shore lines and portions of the larger islands, or traversing the smaller islands completely. In this manner, nesting data as well as population figures were obtained quickly without undue disturbance on any island. Populations were computed for some islands which were bypassed or inadequately covered by applying population density figures obtained from islands of known size which were completely inventoried. With the cooperation of some of the resident game management technicians of the Hanford AEC, Unit I was covered more thoroughly and more frequently than the other two units. In this manner Unit I served as a check area in evaluating data from the other two units.

For economy of time over such an extensive area, we were required to make breeding population estimates for some of the islands in Units II and III. These estimates were based on the number of *observed* geese counted on islands of similar size, physical properties, and cover conditions so that a computed figure, whenever used, should indicate the minimum number of nesting pairs of geese for a given area. Geese listed as "territorial pairs" were only those actually seen together closely attached to a small area and reasonably assumed to be mated territorial breeders. Females flushed from the nest and joined by their mates are included in this category. Undoubtedly some nesting geese were flying with flocks of yearlings and other nonbreeders, and are not included in the tabulated breeding population. Many other geese may have been feeding up in the Horseheaven Hills or in nearby fields at the time of the survey. Disregarding the possible geese absent from the area, we conclude that a minimum of 765 pairs of nesting Canada geese were resident on the 67 islands. Of these, 174 pairs were in Unit II which will be lost for future nesting. Table 1 summarizes the breeding population and observed nests by unit.

TABLE 1. Lower Columbia River Goose Breeding Population

Area	*Observed territorial pairs*	*Computed additional territorial pairs*	*Total minimum expected pairs*	*Total observed nests*
Unit I	231		231	113
Unit II	143	31	174	47
Unit III	208	152	360	122
TOTAL	582	183	765	282

In addition to the total computed breeding geese, there were about two-thirds as many unclassified geese on the river. These were assumed to be yearlings and other nonbreeders and unclassified breeding adults resident in the area in small flocks. Table 2 summarizes the total resident goose population. Preliminary returns from subsequent banding on the river seem to indicate that this particular population of Basin Canada goose, at least, is in permanent residency in south-central Washington, and does not tend to migrate any great distance. Additional banding is contemplated for the summer of 1951, and as more conclusive migration data are gathered, they will be reported.

TABLE 2. Lower Columbia River Total Resident Goose Population

Area	*Total breeding geese**	*Observed non-breeders*	*Computed additional nonbreeders*	*Total non-breeders*	*Total resident geese*
Unit I	462	240		240	702
Unit II	348	182	160	342	690
Unit III ..	720	267	203	470	1,190
TOTAL ..	1,530	689	363	1,052	2,582

*Taken from Table 1.

During the first trip down the river on April 4, nesting activities were in various stages from nest building to advanced incubation. Many nests were still being built on April 10, and a brood was sighted on a subsequent trip April 21. In the limited time available, no special attempt was made to locate all of the nests on any island, although, on some of the small gravel bars devoid of permanent vegetation, every nest was easily located. Altogether 282 nests were observed on 44 islands wholly or partially surveyed. Nesting pairs were computed for the other 23 islands. The peak of hatching occurred between May 1 and 8. Almost all incubation should have been completed before the flood waters arrived late in May.

Incubating clutches varied considerably in size, from four eggs to one nest of 14 eggs. The latter may have been the laying efforts of two or more geese, as may have been the brood of 16 goslings sighted on May 8. On the islands of Unit I the average size of clutches thought to be incubating, however, was 5.6 eggs. Some nests may have been classified as incubating before the clutch had been completed. If so, 5.6 eggs is a conservative average for completed nests. The nesting geese seemed to prefer small, open, sand and gravel islands sparsely covered with low vegetation and driftwood. One 12-acre island of this type supported 25 nests, two only nine feet from each other. Another island of about 340 acres, however, had no nests and only six pairs of geese flushed. The latter was heavily vegetated and seldom completely flooded. Twelve nests were found on one small island of about five acres. This was the greatest nesting density found. On a 300-acre island vegetated with very heavy and diverse cover, 53 pairs of geese were flushed. On many of the islands smaller than 15 acres in size the nesting density averaged better than one nest per acre. Table 3 summarizes the nesting population density on the islands of Unit I. Conditions on the other two units were very similar to the densities recorded in Table 3. Although Table 1 shows a population of 231 territorial pairs in Unit I, only 210 of these as indicated in Table 3 were using islands. The remaining 21 pairs of geese were utilizing steep cliffs and peninsulas.

TABLE 3. Nesting Population Density on the Islands of Unit I

Island Number	*Known or estimated acreage*	*No. of nests located*	*Territorial pairs of geese*	*Expected nesting density (nests per acre)*
1	7	10	10	1.4
2	5	8	12	2.4
3	40	12	30	.8
4	3	0	0	0
5	1	0	0	0
6	300	14	53	.2
7	4	1	1	.3
8	30	2	4	.1
9	6	5	5	.8
10	5	2	2	.4
11	20	8	12	.6
12	60	5	13	.2
13	50	4	7	.1
14	300	0	5	.02
15	20	5	5	.3
16	2	0	0	0
17	60	10	17	.3
18	40	6	10	.3
19	200	16	19	.1
20	15	5	5	.3

Very frequently the geese utilized a slight rise on the terrain as a vantage point for their nests. Sparse, weatherbeaten willow clumps, drifted with sand, provided such hummocks and were often used as nesting "cover." Russian thistle also occurred frequently as nesting cover. Many nests were devoid of all cover and others were situated among small amounts of driftwood and debris. Unusual nesting behavior was noted in several instances. Two pairs of geese used great blue heron nests, one 12 feet above the ground in a colony of nesting herons and cormorants. Three nests were found in a rookery of ring-billed gulls on a small rock bar. Another nest was found in an old automobile tire washed up onto the sand. Table 4 summarizes the nesting cover used for many of the nests located.

TABLE 4. Nesting Cover Used for 177 Columbia River Goose Nests

Nesting Cover Used	*Number of Occurrences*
Willow (*Salix* sp.)	36
Driftwood and debris or bare nest	34
Russian thistle (*Salsola kali*)	33
Lupine (*Lupinus* sp.)	10
Wheat bunchgrass (*Agropyron spicatum*)	9
Giant ryegrass (*Elymus condensatus*)	9
Sagebrush (*Artemesia tridentata*)	8
Cocklebur (*Xanthium* sp.)	8
Wild rye (*Elymus glaucus*)	6
Sedge (*Carex* sp.)	4
Cheat grass (*Bromus tectorum*)	3
Rabbit brush (*Chrysothamnus* sp.)	3
Wild currant (*Ribes* sp.)	3
Wild rose (*Rosa* sp.)	3
Manna grass (*Glyceria* sp.)	2
Smartweed (*Polygonum* sp.)	2
Salt grass (*Distichlis stricta*)	1
Sweet clover (*Melilotus* sp.)	1
Prickly pear (*Opuntia polyacantha*)	1
Wild cherry (*Prunus* sp.)	1

No serious evidence of nest predation could be found. Magpies, crows, ravens, and gulls were common on the islands, but apparently they were little concerned with the nesting geese. Except on the largest islands, there was no sign of mammal activity. Only one nest appeared to have been destroyed by a bird or mammal. There were no instances of nest desertion noted due to activities of the observers working on the islands.

State of Washington
Department of Game

WEASEL FORAGING PATTERNS IN THE ROBINSON LAKE AREA, IDAHO

BILL F. MUSGROVE

In an extensive search of the North American literature on weasels, I have found very little information on the movements of these animals while foraging for food. Food preferences, populations, ecology, breeding habits, and systematic relations have received considerable attention, but there are few observations regarding foraging patterns.

This paper reports the findings of a study made in the vicinity of Robinson Lake, near Moscow, Idaho, during the winter of 1950-1951. The purpose of the problem was to determine the kinds and number of weasels, to what extent they traveled while foraging, whether such movement was in the form of patterns, and the size and nature of such patterns.

I wish to acknowledge the aid and advice of Professor Earl J. Larrison, Department of Biological Sciences, University of Idaho.

STUDY AREA

The area examined lies mainly to the east of Robinson Lake, a small body of water, some four miles northeast of Moscow. It is comprised mainly of rolling Palouse Hills which are for the most part cultivated to grain or peas, interspersed with brushy or wooded (yellow pine, Douglas fir) stream gullies and brushy fence rows. (See photos.) Scattered groves of pine and fir occur throughout the area, mostly on north-facing slopes. Those parts of the Palouse Range known as The Twins and Moscow Mountain lie immediately to the north.

METHODS

Spot trapping at critical points and detailed field observations were considered the best means of attacking the problem. Locations of catch were plotted and records were kept of successful catches, unsuccessful sets, tracks, evidences of kills, and weather conditions. The work was carried out over a period of six months, beginning in September, 1950, and ending in February, 1951. Studies had also been made of the area during three previous winters. The observations of weasels, weasel tracks, and trapping results were correlated in constructing the foraging patterns.

In September, 1950, a line of steel traps was installed, running from one mile west of Robinson Lake to one mile southeast of the lake. The traps were attended never less than two times a week and often three times a week for the duration of the study. Each time the traps were checked after a snowstorm, special excursions were made into the surrounding areas to determine the weasel population, location, and movement.

Two species of weasels were found in the study area, the ermine weasel (*Mustela erminea invicta*) and the long-tailed weasel (*Mustela frenata nevadensis*). The varietal designations must be considered tentative only, as specimens from the general region indicate the necessity for taxonomic reconsideration of the weasels of the Bitterroot Mountains.

In the study, seven long-tailed weasels were taken by trapping while two more were predator kills. Four ermine weasels were trapped. Three ermine weasels and

FIGURE 1. Beginning at the left side of the picture the dotted line indicates the general area frequented by the weasels traveling on the circular foraging pattern which brought them back again to the barn. Near the center of the panoramic view a diamond is formed. The

FIGURE 2. An ideal location for a weasel set. The weasel caught in the trap and centered in the picture was one of seven caught at this place. The set was in the funneling area and within 200 feet of a large timbered plot. The edge of the barn in the upper left corner is a part of the same building shown at the left side of Figures 1 and 3.

area along the lower dotted line was followed by ermine weasels while that of the upper line was frequented by the long-tailed weasels, both weasels then returning by the same general route to the starting area.

FIGURE 3. This picture indicates the small stream with narrow brush-lined banks that formed a natural funneling of weasels into a restricted area.

one long-tailed weasel were still within the area after the last catch had been made.

Trapping was started in September to obtain early specimens for color change and distribution. The number of traps set averaged from fifteen to twenty number "0" steel traps, placed from 100 to 300 yards apart. All sets were made in equally ideal weasel cover. Most were made beneath large logs or brush piles. Two traps were set near the narrow brushy borders of the main stream running through Robinson Lake. A single trap was set near a little stream connecting two large groves of timber and bordered by a narrow fringe of brush.

The type of set usually made consisted of a small pen-like shelter constructed of bark or sticks. One trap was fixed in a similar fashion in a large rock pile. A variety of baits for the sets was used to determine if there seemed to be a preference on the part of the weasels. The baits consisted of chipmunk, pine squirrel, snowshoe hare, duck, pheasant, grouse heads and wings, and deer and red-backed mice. The baits that seemed to be frequented most were pheasant and rabbit. However, this may have been due to the fact that these traps were on the general path of the weasels' foraging pattern.

At one trap location, four long-tailed weasels and three ermine weasels were caught. In another trap one-half mile distant from this set, three weasels were taken, two long-tailed and one ermine. A lone long-tailed weasel caught one mile west of Robinson Lake had been traveling eastward for three days. Its tracks had first been observed three miles below the lake as it foraged up the stream. The rest of the traps were never visited by weasels even though baits were changed and kept fresh.

There were numerous snowstorms from October through February, which undoubtedly caused an accelerated search for food. The weasels came to bait sets very readily in September in areas where natural food supplies were plentiful.

Numerous difficulties were encountered while trapping. One weasel and the trap were lost to a hunter. A feral house cat ate a long-tailed weasel, leaving the weasel's front leg in the trap. A great horned owl found a freshly caught weasel and devoured it except for a front leg and the paw part of the other front foot. One brown long-tailed weasel pulled its trap from beneath a large log and died where the sun could strike it. Four days later, on my return to the set, the weasel was unfit for a study skin. Snow drifting in on the traps and covering them or causing them to freeze enabled several weasels to feed on baits and not be caught. Deer mice, red-backed mice, meadow mice, and pine squirrels continually fed on the baits. Three pine squirrels and nine mice were caught in the traps. This enabled a few more weasels to feed and continue on their way.

The trapping of the area being one phase of the investigation of weasel movements, much valuable information was compiled. The high frequency of catches in two traps and no catches in the balance of the sets showed a general funneling of foraging animals through a particular part of the area. Observation of tracks elsewhere in the study area was used to determine their pattern of travel.

When attending the trap line, detailed observations of the terrain as well as of weasel tracks were made. Only a few traps were set on the general route taken by the weasels in order to study the travel of living individuals and the length of time to return to the main study area. An hour and a half was the usual time needed to tend the traps and examine the adjacent area. After numerous fresh snows, three to four hours were often spent in scouting the countryside as far as three miles from the trap line.

In this discussion, two terms are used which may be defined as follows:

Foraging pattern. The repeated cyclic traveling, usually in the same direction, of an animal or animals over the same area or district while in search of food.

Funneling. The constant frequenting or crossing of a limited area by all or most individuals of a certain species or several species whenever they are in the general district. Funneling is often caused by natural barriers where all animals are forced through one particular location. Overlapping of two foraging patterns may also cause a general funneling effect.

Results

Weasels were found to be most frequent on the fringe of an egg-shaped pattern about two miles in length by a mile in width. The panoramic views (Figure 1) show the main terrain covered while weasels were active on the general foraging pattern.

The long-tailed weasels would spend from seven to twelve days traveling before returning to the starting area. Occasionally one would take a short cut across an open field to connect with a fence row that would bring it back to its regular circle. The short cut would eliminate about a mile of the upper end of the usual route. This field was paced at 560 yards between a fence row of rose and snowberry bushes and a timbered canyon. On one occasion, a weasel had been caught by a hawk while making this short cut. A furrow in the snow four and a half feet long and six inches deep with wing marks on the surface on either side of the furrow and no weasel tracks leading away indicated the fate of the weasel. The fact that the long-tailed weasels in this area remain brown in winter is undoubtedly the cause of a number of them being caught by hawks and owls, as other observations would seem to indicate.

The ermine weasels were found to be using a similar route, except that they were taking a short cut through an old orchard and thence back by way of a narrow brushy stream to thick timber. A few times it was noted that the ermine weasel would make a half circle and then return by the same route it had just covered. These little weasels spent from ten to fifteen days on their circuit before returning. They stayed in denser grass and brush cover than the long-tailed weasels, even though the ermine weasels were totally white. They seemed especially fond of rye grass patches along stream edges.

On three different occasions on consecutive days, I returned to the area to continue observations of tracks made by foraging weasels. This enabled continued tracing of progress made by individual weasels. Four weasels were backtracked, after having been caught, to determine their route of approach. These routes were always the same: through the same brush patches, groves of timber, and fence rows. The weasels were always traveling on approximately the same general route, many times staying within a few hundred feet of a seemingly predetermined pattern.

According to my observations, the two most successful traps, one with seven catches and one with three catches, were on the general foraging pattern. The trap with seven catches was beneath an old yellow pine log lying beside a stream edge lined with brush (Figure 2). The brush narrowed down to less than twenty feet in width in places. This location proved to be the general funnel for all weasels passing through the area (Figure 3). According to the tracks and catches made in this trap, all weasels could have been taken in the one trap, had it been possible to keep mice and squirrels away as well as drifting snow from covering it or causing it to freeze solid. These findings coincide with observations made of weasel movements in the area for the winters of 1938-1939, 1939-1940, and 1949-1950.

General foraging patterns of weasels have been noticed many times while doing professional trapping for fur bearers in Idaho and Montana. Funneling areas can be determined through deductive observation and trapping. When the funneling area

has been located, it may be the most frequented part of a single foraging pattern, the overlap of two different foraging patterns, or possibly the point of overlap of three or more different patterns.

The weasels of the Robinson Lake area did not adopt den holes nor show definite preferences for staying in any one brush or timbered plot. In some localities weasels will establish a den in a ground squirrel hole, hollow tree, or rock pile and will hunt the surrounding territory from the centrally located position. When this occurs, a definite travel pattern is not adopted unless extreme cold weather causes the weasel to leave the vicinity of its den in search of food.

In any habitat suitable for weasels, there will be a small amount of immigration from outlying areas, due to population pressure, predator pressure, and food shortages. These factors may operate singly or in any combination to force a limited number of weasels to move from one area to another.

The detailed study of the Robinson Lake area, with extensive observation and continual trapping, assisted in determining the exact location of the general foraging pattern for long-tailed and ermine weasels, in addition to finding the funneling area in that region for both species.

One interesting item was brought to my attention in regard to weasel color change. In the literature, some authors stress the presence of snow and variations in temperature as the controlling factors in pelage color changes. Others state that such color changes are regulated by photoperiodicity phenomena. In the area mentioned above, the ermine weasels turned white in late fall regularly each year, but the long-tailed weasels changed to a winter pelage of cinnamon-gray upperparts and white underparts. In the more mountainous areas a short distance east of the Robinson Lake region, the long-tailed weasels all turn white in winter. These latter animals, being also considerably larger than the Robinson Lake specimens, may indicate a taxonomic variation.

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University of Idaho, Moscow

GENERAL NOTES

Further Notes on the Green Heron Advance in Washington State.—On August 22, 1949, an adult male green heron (*Butorides virescens anthonyi* Mearns) was collected on the Snohomish River at the town of Snohomish in Snohomish County, Washington. This bird was in its postnuptial molt. Three birds were seen by a local resident in the same vicinity during the summer of 1950, and were last seen December 1, 1950. This is the farthest north record for this species in the state of Washington.

The appended table shows the highlights of the advance of the green heron in Washington in the last eleven years. These records indicate that during that time this species has moved into the state, crossing the Columbia River and advancing northward in greater numbers each year. That they now breed in increasing numbers is indicated, as two young have been seen, though no nests have been found. Also, there is evidence of one or two wintering here.

H. W. Higman and Earl J. Larrison (*Condor* 49, 1947: 87) have observed one or more birds on the University of Washington swamp at the outflow of Lake Washington from 1939 to 1950. One bird apparently wintered over in 1942-1943, being seen January 24 and 31, and February 11, 1943. A bird was also seen there January 26 and February 1, 11, and 20, in 1944. Larrison in his note in the *Condor* assumes they nest north of Seattle. The bird collected and those seen on the Snohomish River tend to bear out this assumption.—GARRETT EDDY, *Seattle, Washington.*

Summary of Advance of the Green Heron in Washington

1939: May 31	Kelso, Cowlitz Co.	Jewett	S	*Condor* 41, 1939:33	First record "north of Columbia R."
1939: Aug. 20	Chinook, Pacific Co.	H.C. Hall	C	Larrison, *Murrelet* 21, 1940:1-2	First collected. Juvenile male
1939: Aug. 24 Sept. 7	Seattle, King Co. University swamp	Higman, Flock, Larrison	S	*Murrelet* 21, 1940:41	Good colored motion pictures
1940: Apr. 16 Sept. 2	Seattle, King Co. University swamp	Higman	S	Letter	Second Spring record
1941: Sept. 7	Tacoma, Pierce Co. Tide flats	J.W. Slipp	C	*Condor* 44, 1942:35	Second collected. Female of year
1943: May 13	Nisqually Tide flats Thurston Co.	J.W. Slipp	C	*Condor* 46, 1944:35	Third collected. Adult male, gonads enlarged.
1943: Sept. 8	Steilacoom, Pierce Co.	J.W. Slipp	C	*Condor* 46, 1944:35	Juvenile. Trace of natal down
1948: Oct. 20	Longview, Cowlitz Co.	G. Eddy	S	Ms	Four seen
1949: May 22 Nov. 5	Seattle, King Co. University swamp	Higman, Laval, Leis	S	Letter	Two young in spring. Two adults
1949: Aug. 22	Snohomish, Snohomish Co.	G. Eddy	C		Adult in postnuptial molt
1950: Dec. 1	Snohomish Co.	Otto Helmke	S	Verbal	At least three all summer to Dec. 1

A Positive Breeding Record of the Starling in Idaho.—The common starling (*Sturnus vulgaris*) has become a regular transient in northern Idaho, with occasional birds wintering in the Lewiston, Nez Perce County, area. During the early spring of 1950, scattered adults were noted along the north side of the Clearwater River just east of Lewiston. These birds were in pairs, and acted as though they might breed. No birds were seen during the late spring or summer, but on October 7, 1950, a juvenile bird, only partially molted into the winter plumage, was taken at the bottom of Central Grade about four miles east-northeast of Lewiston. This bird represents either one raised in the area or a record of a juvenile migrating while molting. The former assumption seems the more logical. The bottom meadows and cottonwood groves of the Clearwater are quite similar to eastern breeding areas, and it is but a matter of time until this species moves in in numbers to possess them.

During the spring of 1951 occasional individuals and pairs were seen in March, April, and May, and again their behavior indicated breeding activity. On May 12, 1951, two occupied nests were found in the Grangeville area of Idaho County. One was found in an apple tree in an old orchard and the other in a box elder in a small grove. The first had six eggs and the second five young about two-thirds grown. The female and two young from the second nest were collected and preserved. Starlings were seen in two other localities near Grangeville and in one locality near Potlatch, Latah County.

The starling was first reported as a migrant in northern Idaho by Bill Musgrove in 1941 (one observed on December 13, 1941, one mile east of Moscow, Latah County). Victor E. Jones reported it in southern Idaho in 1946 (*Condor*, 48, 1946: 142-43). It is a regular, though uncommon transient, winter visitor, and now a breeder in the north, while in the south it is an almost common winter visitor and probably breeder.

It is of interest that the species has selected for its pioneer nesting this open, dry, and rocky grassland, where only small groves or stringers of trees grow in wet spots or along stream courses. The cottonwoods of the larger valleys and the more settled agricultural areas did not attract this species as one might have expected. It will be interesting to watch the growth and spread of this Idaho population.—MALCOLM JOLLIE, *Department of Biological Sciences, University of Idaho, Moscow.*

A New Bird for Washington and Idaho.—A single bronzed grackle (*Quiscalus quiscula*) was collected October 22, 1950, along Paradise Creek, one mile west of Moscow, Latah County, Idaho. The specimen was shot inside the state of Washington about 130 yards from the Idaho line, which was marked by a railroad sign and by the boundary line fence of the University of Idaho farm. The bird was feeding along the creek in a stringer of willows extending across the state line and ending about 150 yards inside Washington. It proved to be a juvenile female partially molted into fresh plumage, but with a short tail. When first seen it was thought to be a late Brewer's blackbird.

On November 19, 1950, a second, but fully mature bird, was observed along the Northern Pacific Railroad tracks, one-half mile south of Sandpoint, Bonner County, Idaho. This bird was first seen high in an exposed cottonwood in a wet meadow. It was wary and would not allow a close approach. It was pursued for about fifteen minutes, but proved to be too cautious to be collected. The long, wedged-shaped tail, V'd in flight, was noted, as were the deep wing beats and dragging tail so characteristic of this species.—MALCOLM JOLLIE, *Department of Biological Sciences, University of Idaho, Moscow.*

NOTES FROM THE FIELD

Strange Behavior of Three Mallards.—On a salt grass (*Distichlis stricta*) flat one mile north of the west end of O'Sullivan Dam, Grant County, Washington, the following strange behavior of three female mallards (*Anas platyrhynchos*) toward a male ring-necked pheasant (*Phasianus colchicus*) was noted on August 16, 1950.

Sixty-three mallards and one shoveller (*Spatula clypeata*) were under observation on a small pothole of less than one-half acre. A male pheasant flew over the pothole from behind an adjoining sand dune and alighted on the salt grass flat about thirty feet from the edge of the water. Immediately three female mallards left the pothole and half walked, half flew, to the pheasant. Upon their arrival near the pheasant the mallards, all quacking very loudly and excitedly, started to walk around him. When the pheasant attempted to move in any direction, the mallards followed and surrounded him. The mallards held their heads high and their necks outstretched. No combativeness was noted, although the mallards stayed at a distance of about three feet from the pheasant which apparently paid little attention to them. The other waterfowl on the pothole showed no apparent indication of interest other than alertness to the quacking.

The display continued for four minutes until the three female-mallards returned to the pothole, whereupon the pheasant flew away.—STANLEY W. HARRIS, *State College of Washington, Pullman, Washington.*

Snowy Owls in Western Washington.—Reports reaching the desk of the editor indicate that the snowy owl (*Nyctea scandiaca*) moved south in record numbers during the late autumn and winter of 1950-51. Theed Pearse reported that the movement started in British Columbia the middle of November, and included the Queen Charlotte Islands. A long-time resident of La Conner, Washington, told Garrett Eddy the invasion was the largest he had seen in over thirty years. Henry Ward Beecher, Jr., saw them on Samish Island and the La Conner Flats, also at Edison and Anacortes on January 7. They were noted in the Seattle area during December and January, one being reported from the business district. Dr. A. S. Lazarus saw several among the driftwood at Long Beach, Washington, north of the mouth of the Columbia River. As usually happens during years of invasion, many birds were shot.

Swan Seen at Crescent, British Columbia.—On February 13, 1951, William Gardiner, manager of the Crescent Oyster Company, informed me that a swan was on their property at the mouth of the Nicomekl River. The Nicomekl River empties into Boundary Bay in the general Vancouver–New Westminster area.

I found the bird on the water close to the shore. The day was clear and sunny, and the white plumage and entirely black bill showed very well. The bird allowed me to approach within less than 100 yards. Then it swam out to mid-channel, where it took to its wings and flew north toward the Serpentine River.

This is my first record of a swan in the Crescent area during the thirteen years I have lived in the district. Older residents have told me that flocks of swans used to settle from time to time on the marsh between the Nicomekl and Serpentine rivers.

Kenneth Racey of Vancouver is of the opinion that this bird was probably a trumpeter swan (*Cygnus buccinator*), as the whistling swan (*Cygnus columbianus*) generally winters far to the south, while a few trumpeters are known to stay on the coast of British Columbia during the winter months (see Munro and Cowan, *Bird Fauna of British Columbia*, 1947, p. 55).—M. W. HOLDOM, *Crescent, B. C.*

ADDITIONS TO SOCIETY LIBRARY

DENVER MUSEUM OF NATURAL HISTORY. *Museum Pictorial.* No. 1, February, 1951. 64 pp. Offset. Paper. No price given.

The staff of the Denver Museum of Natural History (formerly known as the Colorado Museum of Natural History) felt that "there is a definite need for an outlet for the thousands of photographs made of departmental activities of natural history museums." *Museum Pictorial* was launched to provide that outlet and to give to the public the pleasure of seeing these photographs which otherwise would remain in the museum's files. There will be no definite publication dates, although the aim will be toward four or more issues a year.

Each issue will be restricted to a single title. Number 1 is concerned with "Nature Photography with Miniature Cameras," by Alfred M. Bailey, Director of the Denver Museum. It is surprising to see the fine quality of pictures obtained with a small camera. The text is an informal account of the author's experiences while taking the photographs, sometimes in places where "even a 35 mm. and a telephoto lens grow heavy after a day in the field."—MARTHA R. FLAHAUT.

LINCOLN, FREDERICK C. 1950. *Migrations of Birds.* U.S. Dept. Interior, Fish and Wildlife Service, Circular 16. Washington, Supt. Docs. 102 pp. Illus., maps. Paper. $.30.

In this compact pamphlet there are all of the essential facts known of the migration of birds on the North American continent: theories of origin, when, how, and where birds migrate. The flyway concept is treated in detail. The black and white illustrations and maps by Bob Hines are very pleasing, especially the flyway maps. By using symbolized figures of ducks in flight he has been able to indicate assembly points and places of concentration—much more attractive and informative than dotted lines. There is a long bibliography.—MARTHA R. FLAHAUT.

A complimentary copy of *Pacific Science*, Vol. V, No. 1, January, 1951, from the University of Hawaii, contains "A Survey of the Lace-necked Dove (*Streptopelia chinensis chinensis*) in Hawaii," by Charles W. Schwartz and Elizabeth Reeder Schwartz. While titled a survey, the article deals rather completely with the distribution and density of this introduced species, its breeding, and food, according to vegetation zones.

SOCIETY MEETINGS

DECEMBER, 1950.—A regional meeting was held on Saturday, December 2, 1950, at the University of British Columbia, Vancouver. The afternoon session was called to order at 2:00 p.m. in the New Biological Sciences Building by Regional Vice President Ian McTaggart Cowan. Dr. Cowan welcomed the visitors to the University, especially J. M. Winson, a charter member from Huntingdon, B. C.

Field observations were given by Canon M. W. Holdom, on the knot seen on the Nicomekl River; Dr. M. Y. Williams; C. J. Guiguet; Alfred Peake; and by Dr. Cowan, who spoke of the migration of snowy owls through Vancouver about November 11.

The program consisted of a talk by Mr. Guiguet on a mammal survey of small islands off the coast of British Columbia. He mentioned particularly a gigantic race of deer mice discovered on the islands. A lively discussion followed as to the derivation of this race. Dr. Williams was called upon to explain the present knowledge of the glaciation of the region about the Queen Charlotte Islands.

Theed Pearse spoke on the International Congress of Ornithologists at Upsala, Sweden, with an account of the excursions in which he participated.

No formal dinner had been planned because of the uncertainty of the number who might attend.

The evening meeting convened in the Biological Sciences Building at 8:00 p.m. where specimens of arctic birds were examined during an informal talk by Dr. Cowan. The facilities of the zoology and fisheries departments were inspected.—MARTHA R. FLAHAUT, *Acting Secretary*.

FEBRUARY, 1951.—A regular meeting was held February 17, 1951, in the headquarters building of the Washington State Department of Game in Seattle, Washington.

Herbert G. Adams, Portland, Oregon, was reinstated as a member. The resignation of Charles A. Reed was read and accepted.

The new federal regulations affecting scientific collecting permits were discussed. Letters which had previously been solicited from the American Ornithologists' Union and the Cooper Ornithological Club regarding their reactions to the regulations were available for members to read. Burton Lauckhart of the Washington State Game Department explained the attitude of that department toward scientific collecting. The secretary was instructed to write to the Director of the U. S. Fish and Wildlife Service endorsing the suggestions of the A. O. U., and further suggesting that a section be added to the application form that would clarify the exchange of specimens between permit holders.

President Johnson spoke of the confusion in scientific names of small mammals. There is great need of a committee on nomenclature to work with national organizations toward standardization. He volunteered to investigate the possibilities.

The program consisted of the following papers: "Status of Resident Canada Geese in South-central Washington," by Henry A. Hansen; "Habits and Life History of the Chukar Partridge in Washington State," by Raleigh Moreland; "Marine Mammal Hunting on the Northern Coast of Japan," by Ford Wilke (Kodachrome slides); "Results of the Western Washington Deer Program of 1950," by Gardiner F. Jones.

A social hour followed, with coffee and doughnuts provided by the biologists of the Game Department.—MARGARET A. IVEY, *Secretary*.

MARCH, 1951.—A regular meeting was held at the College of Puget Sound in Tacoma, Washington, on March 7, 1951.

The nominating committee presented the following slate of officers for the coming year: *President*, Webster H. Ransom; *First Vice-President*, Burton T. Ostenson; *Secretary*, Margaret A. Ivey; *Treasurer*, Garrett Eddy; *Trustee* (1954), Murray L. Johnson; *Trustee* (1953, unexpired term of Mr. Ransom), Karl W. Kenyon; *Vice-President for British Columbia*, G. Clifford Carl; *Vice-President for the Inland Region*, Earl J. Larrison; *Vice-President for Oregon*, Kenneth M. Walker. There were no nominations from the floor.

Garrett Eddy reported on the progress of *Birds of Washington State*.

The program consisted of the following talks: "The History of Ornithology in the State of Washington," by Jack Cowan; "Notes on Bird Populations," by Gordon D. Alcorn; "Some Small Mammals from Korea and Kamchatka," by Walter J. Eyerdam; "Problems of Studying the Air Sacs in Birds by the Injection Method," by Zella McMannama Schultz.

The meeting adjourned to the Museum room, where the collections were examined, and coffee and doughnuts were served.—MARGARET A. IVEY, *Secretary*.

We regret to report the death of Walter S. Maguire at New Westminster, British Columbia, on March 5, 1951. Mr. Maguire joined the Pacific Northwest Bird and Mammal Society in 1938.

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